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ABSTRACT

This handbook provides a framework that can be applied by other sites that are interested in starting projects similar to the Automotive Technology Education Careers (ATEC) project in which business and education work together as partners. It is designed to guide the reader in planning an automotive technician program, but the steps it outlines can be applied to the implementation of any program. Following an overview of ATEC, each step is described in a separate section that concludes with a "Think About" section with questions and statements to trigger useful ideas for starting the program. These steps are addressed: defining the problem; establishing a time line, priorities, and goals; defining tech prep, applied academics, and articulation agreements; funding a program; selecting appropriate teachers and subject areas; organizing a business advisory committee; developing student qualifications and recruiting procedures; counseling; writing the curriculum; mentoring and job shadowing: establishing business partnerships; understanding laws and liabilities; marketing; and preparation of facilities. (YLB)

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A Model for

PREPARING AUTOMOTIVE TECHNICIANS:

Training for a Qualified Workforce

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A Model for Preparing Automotive Technicians: Training for a Qualified Workforce

Nancy Gupton

Walter H. Edling, Ph.D.

The ATEC project has shown that when business and education work together as partners, everyone wins. This document was developed as a handbook to provide a framework that can be applied by other sites that are interested in starting similar pilot projects. It is designed to guide you in planning an automotive technician program, but the steps it outlines can be applied to the implementation of any program.

The questions and statements in the THINK ABOUT sections are provided to prompt you to think about the information given and to trigger ideas that will be useful as you start your program. It is important to remember that outcomes will vary from site to site.

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ATEC: A Model for Preparing Automotive Technicians

Overview

The workplace is changing. Rapid developments in technology and its increasingly complex applications are changing the expectations of employers and the technical skills necessary for employment. So, you ask, "What does this have to do with me?" Well, if you're an educator, take note. A program established in response to a need identified by two major automotive companies could change the way you see automotive technology and the way you teach your mathematics, English, and science classes.

In 1994, representatives from two major automotive corporations[1] concluded that it was becoming increasingly difficult to find qualified automotive workers. They stood firm on their belief that technicians entering the automotive workforce needed to be better trained. Soaring annual retraining costs called for a reconsideration of the way technicians were being educated. Money was being spent to provide automotive technicians with basic skills—communication, writing, and mathematics—that far too many still lacked at the time they were hired.

The two corporations—which, in partnership with Texas State Technical College (TSTC) in Waco, Texas, had already developed successful programs designed to provide hands-on training for students in the

[1] American Honda Motor Co., Inc., and Toyota Motor Sales, USA, Inc.

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automotive service industry at the *postsecondary* level—began to consider the effectiveness of an automotive technology program at the *high school* level. In such a program, students interested in working in automotive technology could begin their career training at a relatively early age.

The Center for Occupational Research and Development (CORD) in Waco, Texas, was approached to discuss curriculum and structure for the program. Because of CORD's educational background in Tech Prep, a Tech Prep approach was adopted for the project. In addition to representatives from CORD, the Automotive Technology Education Careers (ATEC) project staff included key representatives from the Waco Independent School District (WISD), Texas State Technical College (TSTC)–Waco, the National Automotive Technicians Education Foundation, Inc. (NATEF), Vocational Industrial Clubs of America (VICA), and local automotive businesses.

The goal of the project was to teach basic automotive concepts while using those concepts in the teaching of English, mathematics, and science.

Together, this group worked for a year to develop an automotive technician program that would attract students who had an interest in working as automotive technicians. The main goal of the project was to teach basic automotive technician concepts in automotive technology classes while using automotive concepts in English, mathematics, and science courses. The program was also designed to allow its graduates to transfer courses to TSTC's automotive program with credits applicable to a postsecondary degree and certification to work for either of the two participating automotive corporations.

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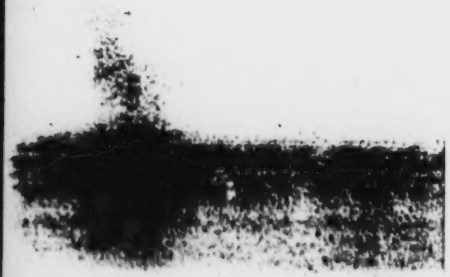
When a time line and performance benchmarks had been established, the team began training teachers and counselors in applied academics, encouraging participation from business representatives, discussing project goals with parents and students, and remodeling the high school automotive facilities for the 1995-1996 school year. During this preparatory phase, curriculum guidelines and standards were also established. The project curriculum had to follow employability standards (SCANS)[2], state and district outcomes, and state and district curriculum requirements. Competencies for NATEF, VICA, Automotive Service Excellence (ASE), Texas Education Agency (TEA) Essential Elements, and TSTC courses were also crucial. The team had to (1) challenge students with a rigid course of study, highlighting the designated automotive requirements; (2) incorporate job shadowing experiences and guidelines as part of the program; (3) keep students on the path of preparing for ASE certification; and (4) make sure students maintained required grades in other courses and passed the TAAS[3] tests.

In making each decision, the project staff endeavored to take into equal consideration key factors pertaining to secondary education, postsecondary education, and the world of work.

In February 1995, the team was ready to market the program to the community. School counselors took the lead, describing the program to students at several WISD campuses in the hope of recruiting them to the ATEC program. Interested students went



[2] As found in the report authored by the Secretary's Commission on Achieving Necessary Skills entitled *What Work Requires of Schools: A Report for America 2000.*

[3] Texas Assessment of Academic Skills.

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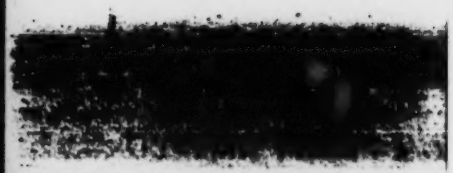
through an interviewing process that involved a business representative, a CORD representative, and several WISD representatives. After student selections were made, counselors spent time with the students' parents, promoting the program and describing what the students would be doing in school.

By April, WISD and TSTC had prepared a program proposal to submit to the Texas Education Agency (TEA). According to the proposal, content for ATEC courses was to be the same as that in courses taught at TSTC, with the exception of a few changes needed to meet TEA requirements for secondary schools. The proposal also outlined course articulation agreements. During this time, automotive facility remodeling efforts were completed. In August, before classes began, WISD formally announced the Automotive Technology Education Careers pilot program to all partners, business associates, local media, and the community.

Ten days later, the ATEC students went to their first classes wearing new ATEC shirts. By the year's end, nineteen of the original twenty-six students found that they had much more in common than the shirts. It was only the end of the first year, but the successes could already be counted. At a banquet held in May 1996, eight students received awards for making all A's in one semester. Another nine students received recognition for perfect attendance. And five students were recognized for both making all A's and having perfect attendance. The school year wasn't even over, and an estimated eighty students were already interested in starting next year's program.



Taking the First Step

Taking the first step in the ATEC project was easy. After all, the problem had been identified. Now, the challenge was to find the most effective solution. Since CORD and TSTC both had excellent track records in the field of technician training, it was natural that they be key players from the outset.

In the initial meeting, representatives from each party discussed the direction the program should take and the steps that would be required to get the program off the ground. As a result of many subsequent discussions, the following steps were taken. Since these steps were crucial to the development of the Waco program, they will be the focus of this handbook in guiding you through the process followed by those who worked on the ATEC pilot project. The steps in this process were the following:

- Defining the problem
- Establishing a time line, priorities, and goals
- Defining Tech Prep, applied academics, and articulation agreements
- Funding a program
- Selecting appropriate teachers and subject areas
- Organizing a business advisory committee
- Developing student qualifications and recruiting procedures
- Counseling
- Writing the curriculum

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Mentoring and job shadowing: establishing business partnerships

Understanding laws and liabilities

Marketing

Preparation of facilities

Think About

- Do automotive dealerships in your community need a more qualified workforce?
- Call several automotive dealers to ask what basic skills newly hired technicians lack.
- Pinpoint the problem, and consider whether it can be eliminated by a Tech Prep program.
- Make a visit to speak directly with a business representative.
- Are you willing to consider additional faculty and staff training for an automotive program?
- Evaluate the success of previous vocational programs and predict possible challenges.
- Is there enough potential business support in the community for an automotive program?
- What existing contacts in the community could be used for this program?
- Will this career path interfere with any other plans of study currently offered?

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Exploring a Typical School Day

The students participating in the ATEC program began the 1995-1996 school year ready to learn. Having been hand picked after an extensive application process, they were eager to become involved in this new program. After one year of participation, these students had an attitude that set them apart from all others at Waco High School. "During the school year, these kids would proudly wear their ATEC T-shirts and work together to make sure all students in the program were successful," says the English teacher. "If one student acted up in class, he or she would be reprimanded by classmates."

For those in the program, the school day was structured differently. Students were scheduled as a group to take English, geometry, and other core courses in the fall in combination with specific automotive classes. During the spring, they took physical science and other core courses and attended automotive classes. Science and math were taken during different semesters because teachers thought these two classes might be too much for students to handle simultaneously. This sequence also allowed time for students to become comfortable with the automotive concepts and gradually see how the concepts relate to other subject areas.

Teachers with many years of experience were seeing how their usual coursework could be given a new twist by the addition of Tech Prep and automotive concepts. Teachers also saw how they could learn from one another. Three of the four teachers involved

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had some experience with automobiles and understood how they function, which helped in curriculum development and class planning. But more importantly, the teachers met often to share their observations on the effectiveness of various techniques. These shared observations made it possible for the teachers to make effective adjustments in their teaching methods as the program developed.

Teachers involved in the program were delighted to see how these once shy and quiet students had suddenly "come to life." Students who were known as "locker huggers"—students who walk close to the lockers so they won't have to talk to anyone—suddenly got involved and took an interest in learning. As students learned about diesel engines, gas engines, jet engines, small engines, outboard motors, paint and body, professional development, and other job-oriented topics, they also were learning the importance of writing, communication, and math skills. The geometry teacher described the transformation of one student this way: "Kids who never took an interest in math or English were doing better. One of the students was in remedial classes before getting into this program. He was already planning on dropping out, but at the end of the school year, his grades had improved dramatically, and he was awarded for perfect attendance."

Teachers involved in the program were delighted to see how these once shy and quiet students had suddenly "come to life."

During the spring semester, students began to participate in job shadowing. Every Thursday morning, students visited their worksites to shadow for at least an hour. This time was designated to allow them to observe the use of skills they had learned in the

classroom. Some students said they also observed technicians working with customers, calculating numbers, and solving problems; these observations gave the students a real-world idea of what the industry is like on a daily basis.

ATEC students worked hard during their first year—some spent weekends competing in VICA shows, some worked during off hours on the cars in the automotive classroom, and some applied for summer jobs at the sites where they did their job shadowing.

Establishing a Time Line, Priorities, and Goals

After discussing the idea for the ATEC project, the partners met to define deadlines and commitment from all players in developing and implementing a national Tech Prep model for an automotive service training program. The five partners completed a twenty-month time line for developing the pilot. These partners met regularly to discuss interests, needs, and expectations.

In addition to setting deadlines according to the time line, the group established long- and short-term goals. Staff orientation and training were the short-term goals. Long-term goals included everything from curriculum design to facility preparation. The purpose of establishing each goal was to update each person involved in the project concerning partner and advisory committee member priorities. When these goals had been established, it was time to set the program in motion. After all, they had students ready to start a school year learning about automotive technology.

No matter what the topic of discussion on the time line, the main priority was to remember the emphasis of the program: to provide for growth, to train students for emerging occupations and technology, and to help state economic development by training prospective employees for jobs in the state and in the community. This emphasis served as the foundation for each decision made along the way.

Think About

- Does your staff consist of organized and motivated individuals who are willing to work with deadlines and develop goals?
- What kinds of goals need to be established to get the program off to a steady start?
- Consider how much time it will take to get an automotive program off the ground, if this is the first one.
- If this is not your district's first pilot project, how long will it take to get an automotive program started considering the success of the first project?
- It is important to start this kind of a program with a clean slate. Don't add to existing programs.
- What are some of the priorities you would like to see placed on your automotive program?
- Consider how far out your committee needs to start planning.
- Try to predict the areas where problems could develop and require more time for planning and solving.
- Allow time to coordinate numerous schedules in meeting with partners.

Defining Tech Prep, Applied Academics, and Articulation Agreements

The ATEC pilot project was designed to provide students with the communication and mathematical skills necessary for them to work confidently and competently in the automotive field, whether after high school graduation or after completing a postsecondary program. All parties agreed that CORD's applied academics materials provided the best approach to implementing a curriculum that would provide these skills and give students a knowledge base for future educational opportunities. From the program's outset, everyone involved in planning was given general knowledge about the terms that would be used throughout the development and implementation of the ATEC project. This was a good approach because people working in the business and educational sectors often speak different occupational languages. Key terms are defined below as they were defined in the ATEC project and as they are used throughout this handbook.

Tech Prep[4] is an alternative to the college prep path of study, but it does not provide an "easy way" for students to get out of high school by taking watered-down courses in science, mathematics, and English. Tech Prep is based on the premise that good technical education can be provided and attained if students have a solid academic foundation that includes a thorough understanding of basic mathematics, science, and

[4] Dan Hull, *Opening Minds, Opening Doors* (Waco, Texas: CORD Comm

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communication skills. Tech Prep is a method of teaching that focuses more on *how* you teach than on *what* you teach. It takes into consideration the learning styles of the majority of students and therefore adopts a more hands-on approach commonly known as applied academics or contextual learning. In fact, Tech Prep has given teaching new meaning for educators participating in the ATEC program. For example, the ATEC English teacher said, "I have enjoyed teaching using the Tech Prep method. Other teachers have asked me how they can get more information and participate in Tech Prep programs for their departments."

In teaching **applied academics,**[5] teachers are allowed to act more as facilitators, using laboratories and real (or simulated) work environments where students can see theories, phenomena, processes, skills, and techniques applied in practical contexts. Applied learning allows students to learn the way they learn best—through hands-on activities, case studies, job profiles, group problem solving (focusing on real work problems), and on-the-job worksite learning opportunities.

Articulation agreements[6] are important in any Tech Prep program because they provide the coordination of policies and practices between sectors of the education system to produce a smooth flow of students from one sector to another. All those participating in the ATEC pilot project—WISD, TSTC, students, and parents—understand that credits received from certain automotive courses will articulate (transfer) to TSTC, giving students postsecondary credit. The bottom line is that students who want to articulate have already taken necessary basic courses and will be ready to take more advanced courses without time-consuming remediation.

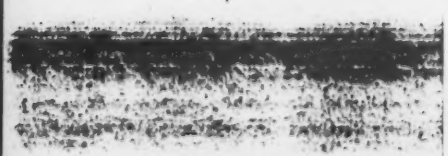
[5] Hull, page 12.
[6] Hull, page 126.

Think About

- Would training in applied academics and Tech Prep benefit the success of your program?
- If you are trained in applied academics, would follow-up training be beneficial?
- Are there existing articulation agreements that can be reworked to include this program?
- Do all members of your committee understand articulation and how it affects future students?
- Has anyone in your group worked with business before?
- Will your business contacts be familiar with the terms involved in a Tech Prep program? If not, what do you need to think about before you approach and talk to business representatives?

Funding an Automotive Program

The discussion time spent on funding was lengthy. The budget had to be planned as precisely as possible. Even after intricate planning, the ATEC program depended on various forms of outside assistance from each partner and business affiliate involved in the automotive program—financial assistance from all partners, and volunteer time from business and teachers. Most partners came into the program with a strong commitment, but, no matter what the response, everyone's assistance made a difference in the remaining costs to the school district. The major areas of funding included meetings, luncheons, and banquets; curriculum development; text-



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books; facility preparation; printing; field trips; travel for training or industry site visits; supplies and tools; and staff development. Of course, the resources available to meet these needs directly affected the quality of the program and the available opportunities for the students.

Everyone's assistance made a significant difference.

The industry partners and business affiliates understood WISD's needs in developing the program and bought in to the idea immediately. Each understood the importance of giving the students a quality program. The WISD school board responded favorably to the idea as well, after a presentation from the coordinator for career and technology education and a counselor from WISD, who stressed the importance of the program in preparing students for the workplace and as a means of developing teamwork among students.

WISD's coordinator for career and technology education stressed the importance of applying for as many grants as possible in the first year of a pilot project. The funding for the ATEC project came from regular vocational funds, in addition to small grants. Additional assistance was provided by business and industry through equipment and supply donations. Cars used in the automotive lab were provided through TSTC's T-TEN program. By the end of the first year, the coordinator began work toward funding for the next year by reapplying for funds from industry partners and from any other related foundations.

Think About

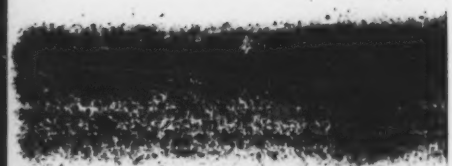
- How much funding can your school district provide to a pilot program?

- Do you feel comfortable taking the responsibility for writing a proposal seeking grant funds?
- Will local automotive dealerships (or companies) be willing to assist with your program to help cut costs for the school district?
- Do you feel you could learn more about available funds for programs such as this?
- Use the Internet as a resource in looking for possible funding sources.
- Would you be able to find support for an automotive program if you applied for grants?
- How much time can your staff devote to finding resources for funding?
- Does the school already have good business contacts in the community who can be considered for financial assistance?

Selecting Appropriate Teachers and Subject Areas

"The reason I have been successful this year is because the ATEC teachers and the principal have been like a family to me. They have encouraged me all year long," says one first-year ATEC student. That's a strong statement coming from an individual who once considered school a "waste of time." Selecting the right teachers for a program like this is of major importance, and can mean the difference between success and failure.

The teacher selection process started early in the project development. "It was important to get them acclimated to the project



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philosophy. Because we involved them early on, they were able to attend automotive facility tours and look at the curriculum being used," said WISD's coordinator of career and technology education. Teachers were chosen by department chairs. The science, English, and mathematics chairs were told about the Tech Prep pilot, and were asked to choose the people on their staffs they thought would be best to participate. It didn't take long before the English and mathematics department chairs decided they wanted to represent their departments, instead of choosing other staff members. The science chair chose a physical science teacher who had experience working with small engines and had taken several classes on how to repair farm equipment. The automotive technology teacher continued in his role, but had to incorporate additional VICA and NATEF standards, which came from TSTC's first-year automotive class. When asked if they would do something like this again, all agreed that, no matter how much time was demanded of them, they've never regretted getting involved.

For teachers, getting involved required lots of time and hard work, but none expressed the least regret.

Teachers were finding that the project demanded a new level of involvement. "This was a new way of teaching," says the geometry teacher. "Our main objective was to teach toward the automotive curriculum while including the essential elements." The process was arduous; the four teachers worked as a group on their own time through the summer months to develop the curriculum and teaching strategies. "The one drawback of working with teachers from other departments was that when it was time for departmental planning during the school year, it was hard to find time to meet and work on the project," said the science teacher.

As the project advanced, the group found they had to be on their toes. They were suddenly looking for time to have short meetings in the hallways and in the cafeteria about changes one teacher made that would benefit a lesson another teacher had prepared. These meetings were advantageous in that all four teachers could take a few minutes to talk briefly about the positives and negatives of a lesson or a breakthrough with a certain student. The automotive teacher initiated many of the impromptu meetings. Because this was a new program, he found that sometimes he had to quickly make changes to his curriculum and the other teachers had to respond.

While working on the pilot project, teachers still had responsibilities in other classes and had to set aside and include lesson planning time. But the staggering of semesters helped in the teachers' planning and preparation time.

Think About

- Which subject areas do your local automotive dealers see as weaknesses among graduates?
- In choosing the best teacher to work with developing an automotive program, consider each teacher's motivation, responsibility, willingness to learn new teaching methods, and willingness to integrate automotive concepts into his or her existing curriculum.
- Consider selecting those teachers who might have experience working with automobiles.
- If your teachers have no prior knowledge of automobiles, can you afford to train them in the basics of automobiles?
- If selected, how much time do teachers have to dedicate to developing the curriculum?
- Will these individuals work well as a group? They will spend a lot of time together.

Organizing a Business Advisory Committee

The advisory committee, composed of representatives from automotive dealerships and automotive repair shops, contributed time to provide the group with ideas that helped make the program's first year successful. These individuals played a big part in the student selection process. Committee members volunteered to be part of the interviewing panel that selected those students who participated in the 1995-1996 ATEC program.

In accepting committee responsibility, members also were responsible for participating in the job shadowing program, participating in on-campus team teaching, conducting mock interviews, and providing site visits for students and teachers.

The one complaint from committee members concerned the meetings. The best time for most to meet was over the lunch hour, but the meetings often ran over, putting people back to work late. After deliberation, the group was able to hold luncheon meetings from exactly noon to 1 PM. A prepared agenda helped the group stay on track and accomplish specific tasks.

Think About

- What commitment could you expect from local automotive representatives?
- What representatives from your school or business could attend meetings during lunch? Would any other time during the day be better?

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- What could these two groups (education and business) learn from each other?
- Would a business advisory committee be considered a valuable part of the process in developing your automotive program?
- Who would be a good person to be responsible for organizing and establishing agendas for these meetings?
- When would be the most beneficial time to bring in a business advisory committee?
- Consider the different areas in which advisory committee members' input could be used.
- Be sure members understand what is expected of them throughout the program.

Developing Student Qualifications and Recruiting Procedures

One year following the initiation of the idea from industry, the partners and advisory council worked with the secondary counselors, teachers, and principals to determine ways to recruit and to establish student qualifications for participation in the program. With help from business, American Honda, and Toyota Motor Sales, admission criteria were developed; they included completing the application, meeting school attendance requirements for the previous year, having an overall passing grade, and passing the interview process based on answers to the question: Why would you like to be in the ATEC program?

Counselors played a key role in the recruitment process. In the spring prior to the 1995-1996 school year, a presentation was

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made to students who were already taking automotive technology classes about the opportunities that would be available through ATEC. The career and technology education counselor spoke to all ninth-grade classes, disseminated applications, and spoke to students individually. Prior to receiving eighty-one applications, all involved knew only thirty students would be accepted.

An interviewing committee—consisting of a business advisory committee member, a faculty member from TSTC, a CORD staff member, and WISD's coordinator and counselor for career and technology education—carefully considered each student applicant. The committee tried to determine which students wanted to be a part of the program, whether they met the established criteria, and whether they would be likely to stay in the program until graduation. To give benchmarks to their evaluations, the committee developed a point value system to help narrow the field to thirty applicants.

In her own words of advice about the selection process, the ATEC career and technology counselor said, "The students you select matter the most. The students will make or break the program, so choose them carefully."

After the evaluation process, thirty students received acceptance letters. Counselors also followed up with letters to those who were not selected. The counselor and principal sent letters to the

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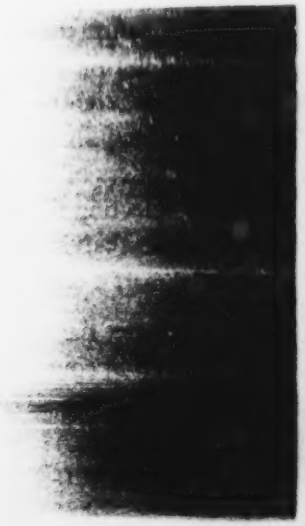
parents of the selected students explaining what ATEC would mean to their children's education. Parents and students received invitations to an orientation meeting about ATEC. By the end of the application process, twenty-seven of the thirty students were enrolled in the automotive program.

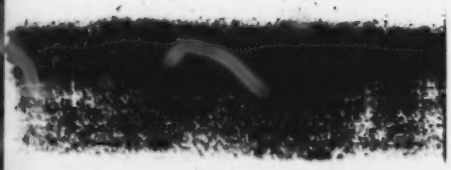
Think About

- In developing an automotive program, consider whether your school has students who are interested in this type of program.
- What kind of participation can you count on from staff members?
- Who can best define the qualifications placed on students who want to participate in this type of program?
- What kind of criteria will you have to develop based on your student population?
- Consider how far in advance you need to begin working on the recruitment process.

Counseling

"I try to make myself accessible at all times. These kids have my home phone number and my beeper number. We hang out together and do stuff other than just with the ATEC program," says the career and technology education counselor. This kind of dedication came from the career counselor working with the pilot project. Many hours of preparation time went into getting all the details and direction of the program together before counselors went to students at two high school campuses, a ninth-grade campus, and five middle school campuses.





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This pilot project was set up to involve students from two high schools. Because of the structure of the Waco Independent School District, the counselors are spread over several schools. After attending middle school, students living in one part of town advance to a ninth-grade center, while students living in another zoned area advance to University High School (one of the two schools participating in the program). Students attending the ninth-grade center advance to Waco High School to complete grades ten through twelve.

Even though there were many campuses, the counselors were able to organize the recruiting campaign and get the word out about ATEC program opportunities. At the end of the 1994-1995 school year, eighty-one students had applied for places in the program. And that was where the counselors' work really began. In addition to recruiting responsibilities, counselors talked to parents of ATEC students, worked with WISD in getting the proper forms developed, researched background information on students wanting to participate in the program, monitored student test scores (before, during, and after the first year), and interviewed students and teachers for program evaluation. These same responsibilities will be required of the counselors as the program continues.

The recruiting process was the most time-consuming part of the program for each counselor. But, because they had come to know the students, the counselors were able to provide additional information during the selection process. The major areas emphasized during the selection process were annual class attendance records, eighth-grade test scores, and class credits. If the students had disciplinary problems and wanted to apply, they had to provide two letters of recommendation from teachers. Those responsible for selecting the students were CORD, TSTC, counselors, and a business advisory committee member. The interviewing process took half a day per school.

After the student selection process, the career and technology education counselor for the district sent letters of acceptance to students with an invitation to participate. She also called the par-

ents of each student to answer questions they might have about the program, get them involved in their child's education, and establish a rapport. The following week, a meeting brought together parents, students, and teachers. This allowed for another question and answer session.

Scheduling of classes required an in-depth understanding of what each student hoped to accomplish in high school. It was a time-consuming process that prompted students to think about what they wanted to do after high school. By the time the students were selected into the program, counselors had little time to place thirty students together in four classes without interfering with other classes. For example, they had to consider the schedules of students in honors programs. The solution was to hand-schedule each ATEC student.

Students appreciate and respond to the dedication of teachers and counselors.

At the start of the 1995-1996 school year, counselors found themselves on call for immediate questions, problems, or changes. The students noticed and appreciated the dedication from the counselors. "My counselor was always available, and she did a great job of answering any questions I had," said one student in the program.

Working so closely with these students made the program a special one to the counselors and the teachers involved. The students needed to know how important this program was to their futures and to improving education in the schools. One counselor said, "I work with several of the school-to-work programs, but this was the first Tech Prep automotive program; I made sure the kids knew how special they were. They were the first group, and we treated them like special individuals."

THINK ABOUT

- How much time do your school counselors have to assist students enrolled in a new program?
- Does your school district have a counselor who has a working knowledge of vocational occupations?
- What kind of roles do you see your school counselor(s) playing in a new program?
- How difficult will it be for students to be put together in addition to taking other required courses?

Writing the Curriculum

Selecting the appropriate curriculum and the right teachers to teach it was crucial to the success of the pilot project. It was a long, difficult process that took the mathematics, English, physical science, and automotive teachers the summer months to work through. The teachers had received training on the concepts of applied learning that helped them as they developed their "strategy." It was important the teachers understood, up front, what was expected of them and the program because it is part of a four-year longitudinal study to see if this teaching and learning approach will improve test scores.

The teachers used their time wisely, identifying ways to integrate automotive concepts into the curriculum they were teaching. And, as stated earlier, teachers continue to revise their teaching methods and the curriculum to fit the automotive objec-

tives. Teachers found themselves referring to textbooks other than those previously used in class. For example, the geometry teacher used the *CORD Applied Mathematics*[7] materials to enhance her lessons. "Students were learning about simple machines in my class and were able to relate the pulley, lever, and inclined plane concepts to the automobile," says the geometry teacher. The science teacher referred to other physical science textbooks, *Principles of Technology*[8] materials, and the automotive manuals for ideas.

For students in the pilot project, the geometry and science teachers used the automotive classroom as their laboratory. Since the equipment was already assembled, this was an ideal environment for students to see how the automotive and math and science concepts related. The English teacher was able to integrate automotive topics that motivated students to work on their verbal, writing, computer, and research skills. Additional motivation came from classes taught by the career and technology education counselor on interviewing, job skills, and dealing with work-related situations, which assisted students in their job shadowing.

The Waco High automotive teacher and WISD's coordinator for career and technology education and counselor partnered with TSTC's program chair of automotive technology. Together, they studied the curriculum used during the first year of the automotive program at TSTC and decided to use the same materials at the high school level. They also took into consideration the need for this to be a curriculum suitable for high school students based on standards set by the state, college requirements, and NATEF and ASE certification. This would help prepare students at an earlier age and reduce the need for remediation at the postsecondary level. The program was structured so tenth graders would take the introductory courses, which meant they would get an overview of the following: diesel engines, gas engines, jet engines, small engines, outboard

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[7] *CORD Applied Mathematics: A Contextual Approach to Integrated Mathematics*, 40 units (Waco, Texas: CORD Communications, Inc.).

[8] *Principles of Technology*, 14 units (Waco, Texas: CORD Communications, Inc.).

motors, paint and body, and professional development. Because of the competencies required by industry and for college credit, automotive technology and safety were the areas of greatest emphasis. Upon completion of these courses, students would receive two hours of college credit. The TSTC representative continues to work with his contacts at WISD and agrees this program has been worth the effort.

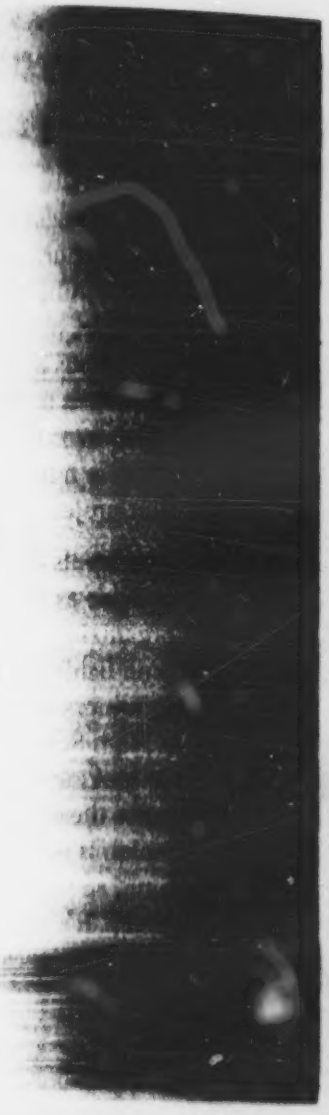
"We were lucky enough to have a campus coordinator (WISD coordinator for career and technology education) with a background in vocational education to work with us." The district coordinator regularly met with the teachers to share observations and provide direction. She attended in-service sessions where teachers could spend time working on curriculum development, discussing possible changes and new ideas.

Work continues as the program adds advanced levels of learning, but as of the end of the 1995-1996 school year, the teachers were enthusiastic and looking forward to a summer of curriculum development for year two.

THINK ABOUT

- How much time can you devote to developing a curriculum for a new program?
- Who would be interested in and enthusiastic about participating in a new program?
- Do any teachers have contact with anyone in the automotive industry?
- Do any teachers have a working knowledge of repairing automobiles?
- Would this program be a way of bringing together staff members in departments that do not normally work together?
- Does someone in your school district have a working knowledge of opportunities in today's technical fields?
- Can your school district partner with local postsecondary institutions to work on (or borrow) curriculum ideas?

Mentoring and Job Shadowing: Establishing Business Partnerships



"A good technician can go to work today in any town I know in the United States," says one business representative involved in the job shadowing component of the ATEC program. As defined in this program, job shadowing is an allotted amount of time on a specific day where students observe skills, as they pertain to their area of study, at an assigned worksite. In this program, the designated amount of time for students to spend on site was one hour and a half. This was not always the case. Transportation posed the biggest problem in getting students to the sites at specific times. Too much time was used getting students to the sites and not enough used as shadowing time.

The district has spent time working through this problem, and one business has offered the use of a van to get students to their worksites. The school district will look into liabilities and insurance and possibly use this as a means of transportation for the second school year. Of course, if a student drives his or her own vehicle, he or she may drive to the site and bypass school transportation.

The job shadowing component plays an important part in students' grades. They are evaluated by their site mentors, and the evaluation plays a part in their final semester grade. "I enjoy getting away from school and getting to talk to guys working on cars. It helps all the classroom stuff come together," says one student.

Getting business involved and establishing partnerships was not a problem. Letters

were sent to all automotive-related businesses in the Waco area, and many of those who were contacted were eager to be involved and participate in the job shadowing component.

As one business representative put it, "A technician is no longer classified as 'the person who can't pass anything, so let's put him or her in shop.'"

The business people participating in the job shadowing experience are encouraged by the changes they have seen in the students. They are willing to work and help the students however they can. For example, one business participant said that one day his student missed the bus and no one could bring him to the site. The businessman went to the student's home to pick him up. Some business representatives have said they would like to see the students at the worksite for a longer period of time, and this might be possible as the pilot project advances.

The levels of business participation have varied. Some people gave advice as the project developed; some helped with planning and organizing the job shadowing component, researching insurance and liability issues, and working with their attorneys prior to letting minors work on site; and several have taught classes at Waco High School. "We're not looking for mechanics anymore, we are looking for technicians who are good with math, who are computer literate, and who can read and can understand others. A technician is no longer classified as 'the person who can't pass anything, so let's put him or her in shop,'" says a business representative. "It's important to remember that this type of program is long term. If you expect results in a year, you can just expect to fail."

THINK ABOUT

- What kind of problems can you anticipate in having your students participate in a worksite experience?
- Does your school district already participate in this type of learning experience?
- Do you have adequate transportation? Can participating students be picked up at their homes on the days they will be job shadowing?
- Do you feel up-to-date on the legal issues and liabilities for allowing students to participate in worksite learning experiences?
- Does your school already have automotive business partners involved in other campus programs?
- Do you feel comfortable talking to business representatives?
- Have you considered that business may not understand the language used by educators?
- Do you have a booklet with a comprehensive description (possibly written in the marketing phase) of the program and the responsibilities of business partners?
- Consider in what role business can best contribute to the success of your automotive program.
- How much time in a day can be devoted to job shadowing?

"We were concerned about the liability of the shop and the fact that our insurance carrier would not want to be responsible for the students being in the shop." This business representative was dedicated to the project, but wanted to make sure that, by getting involved, he would not be liable for having students in his shop facility. He continued by saying, "We looked at the job shadowing forms from WISD and took them to our corporate attorney. We worked through all our questions and revised our job shadowing forms to something that would work for both the students and the business."

As the original project staff worked through the time line, they knew they would have to look closely at the laws that govern workers under a specified age because of the ATEC job shadowing opportunities. In addition, liabilities were an issue to consider. Since the students were to observe only, most businesses felt comfortable with their liability insurance. Soon after businesses met with WISD representatives and agreed to get involved in the ATEC program, representatives from WISD's insurance company and law firm made a presentation allowing business representatives to ask questions about their shops' involvement in the job shadowing part of the program.

It is very important to be knowledgeable of child labor laws and how they might affect implementing a pilot project, especially one involving job shadowing. Fifty-one sets of

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child labor laws are available in the United States. Each state has its own laws, which vary from state to state, and the United States has a set. These laws were created under the Fair Labor Standards Act of 1938 (FLSA) and are enforced by the U.S. Department of Labor's Wage and Hour Division. If you would like to know how these laws affect your program, contact your local office of that agency.

Think About

- When working through job shadowing involvement, it is recommended that both business and education consider the following issues: age, driving on the job, workers' compensation liability, liability in transit, the Occupational Safety and Health Act (OSHA), and employee harassment.
- Is anyone working with the project familiar with these issues?
- Has your school district already implemented new programs such as this? If so, maybe an individual can bring your group up-to-date on these issues.
- Remember to work closely with businesses so they do not feel threatened by having students on site.
- Be sure teachers have enough support in this area to prevent losing class time while making necessary arrangements.
- Are there any existing forms to use as guidelines?
- This is an area that must be taken care of before the shadowing begins, so begin early enough to avoid losing time during which students could be at the worksites.

Marketing

Developing a marketing plan was a tedious task. With so many people involved in other areas, it was hard to find time for getting the word out about ATEC. In addition, funds were scarce. Therefore, the district decided to do only what they could afford financially, and depended primarily on word of mouth.

Presentations made at Tech Prep conferences, to school board members, to business representatives, to students, to parents, and to other community leaders were the initial methods chosen to market the program. And each presentation served as an opportunity to sell at least one more person on the mission of the program.

One important marketing tool in promoting a product is the use of visuals, so the design of an ATEC logo was next on the agenda. The logo's design came from the art teacher from one of the participating campuses. This helped to give a unifying element to the promotion of the program. The logo seemed to open the door for promotion. It was used in a brochure and on invitations to meetings and banquets, and it appeared on any form of written communication about the program. Students in the program proudly wore T-shirts with the ATEC logo. Adorned with the T-shirts, the students became great billboards for the program. They wore the shirts on field trips, to VICA competitions, to school, and to many other events.

To kick off the program, a formal announcement and an invitation to attend the

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opening of the automotive facilities were sent to city officials; members of the Chamber of Commerce; city, state, and national officials; and school staff. The media—including radio, print, and local TV news programs—also assisted in providing coverage of the event. With little district funding, the group was able to get the word out and had a large attendance at the event.

Think About

- How much time will you be able to dedicate to marketing?
- What do you want to accomplish by starting an automotive program?
- What media would be useful in targeting your audience?
- Do you have funds set aside for marketing purposes?
- Can you estimate how much money it would take to do an effective job of marketing your program?
- Have you ever worked in a marketing capacity before?
- Are there individuals who would contribute their time in getting the word out about your program?
- Consider starting your marketing campaign early in the program.
- What forms of marketing have been successful in promoting other school programs?
- Consider what could be marketed as the program's benefits to students rather than what the program will do for the school.
- How could business help in marketing the program? Could they donate resources or act as a means of reaching the community with a message?
- Are there staff members with marketing experience, or would contracting work out be a better marketing alternative?

Preparation of Facilities

Waco High School offered automotive technology courses prior to ATEC, so there were facilities on campus. There was one problem: the facilities needed work. During the summer, bids for remodeling and painting were obtained from local construction companies, but they were too high. That's when, with the district's help, the project staff decided to roll up their sleeves and get to work, which meant cleaning and painting the classroom, garage, and instructor-office areas. Furniture was either acquired or refinished for the classroom and office.

The facility was painted in a coordinated, tricolor scheme. Work benches, storage shelves, and cabinets also were painted. The classroom and office were already air-conditioned, but the garage facility was not, so circulation fans were installed in the roof. In addition, numerous safety hazards were corrected.

All hand tools, power tools, toolboxes, and laboratory (shop) equipment were cleaned and inventoried. Twelve identical sets of tools were assembled in student toolboxes—enough to accommodate up to twenty-four ATEC students (two students per box). In addition, three roll-around toolboxes were fitted with tools to accommodate up to twenty students. An instructor's master tool set was also assembled; it includes tools beyond the minimum needed for teaching the automotive program.

This renovation effort helped reduce the cost and influenced other areas:

1. Plans for upgrading the facility included the installation of additional lighting in the garage area. However, the combination of cleaning, painting, and the new color scheme brightened the area to such an extent that additional lighting was not needed.
2. As the upgrade process progressed and the appearance of the facility improved, WISD maintenance personnel displayed enhanced pride in their craftsmanship. On several occasions, they revised previous work so it would look better.
3. Even in adjacent facilities, the renovation effected change.

Think About

- How much work needs to be done to your facilities?
- Can your project afford an outside contractor? If not, is your staff willing to contribute time to work on the facilities?
- Consider the cost of purchasing tools. Can your project afford to stock all toolboxes with matching tools?
- Consider the amount of time needed to remodel. Also, consider how far ahead you should start upgrading your facilities.
- What resources could business partners offer in updating the facilities?

Conclusion

At the end of just one year, yet another group of people can speak for the results a Tech Prep program produces in public education. The administrators, faculty, counselors, parents, students, and members in business and industry agree the ATEC program is powerful and capable of changing the education students receive today. They understand the program represents what learning should be and have labeled it a strong model that allows public schools to change and meet new standards in education. Although after only one year of the project it is too soon to see a dramatic change, the apparent changes in academic and social progress have given hope to the ATEC team members that this program is building a better, stronger future.

All those who contributed to the success of the first year have a strong dedication to the continuation of ATEC. Students have made it clear they appreciate what the program has done, and they look forward to the challenges and opportunities facing them in ATEC's second year. The counselors are already in the process of determining what to do with the increased number of student applicants. Will they approach administrators with the proposal to expand ATEC with more classes and more teachers, or should the classes continue with thirty students? Business representatives have expressed their appreciation to the school district for collaborating with them, giving them an opportunity to help students and the community. Based on the changes they've seen in students, automotive employers have been forthright in

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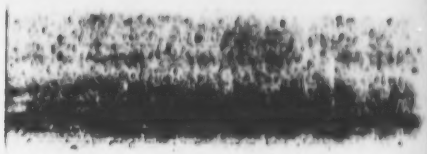

saying that ATEC is a program more schools should offer to their student bodies. After all, the employers will reap the benefits of having better-trained technicians.

The implementation of Tech Prep, the dedication from students and teachers, the encouragement from the administration, and the support from the business community have contributed to a positive first year—ATEC is on the right track.

ATEC has made a difference in a school district where the number of students choosing to work toward GEDs or dropping out of school before graduation was growing. The ATEC program appealed to many different students. Some were honor students, while others were bored with school and didn't see a reason to continue. After becoming involved in the program, nineteen students took more interest in school. This program is allowing students who enjoy working with technical equipment to use their minds and hands while moving toward successful careers as automotive technicians. This is a chance for students to learn how to be self-supporting individuals while getting a solid education.

* * *

Update

The foregoing was written at the conclusion of the first year of the ATEC program (1995-1996). Now in its second year, ATEC continues to make excellent progress in the fulfillment of its mission—the effective teaching of basic automotive concepts at the high school level and the integration of those concepts into English, mathematics, and science courses. Inevitably, there have been obstacles and setbacks along the way. One trained instructor was transferred to a different campus, and several students had to drop out of the program because of personal problems or scheduling conflicts. Class time was lost to remediation activities pertaining to the Texas Assessment of Academic Skills (TAAS), and there were difficulties arising from student transportation between schools. Even graduation—by any other measure an occasion to be celebrated—had a dampening effect when three students graduated before completing the program.

These and other problems aside, ATEC has greatly enriched the lives of the students involved. ATEC students learn to take pride in themselves and their work and to be an encouragement to one another. They develop a strong sense of camaraderie and team loyalty. ATEC encourages leadership by giving students a voice in organizing their curriculum sequencing and managing their own classrooms. ATEC also encourages achievement and gives students a sense of direction. All of the ATEC students who participated in the regional Vocational Industrial Clubs of America (VICA) competition are advancing to the state competition. Three seniors and one junior are preparing to attend TSTC–Waco.

The ATEC program is also maturing at the administrative level. WISD, which was one of several original project partners, maintains and develops the program for each high school level as planned for the project. Apart from Toyota Motor Sales, USA, Inc., which continues to provide assistance to the program through TSTC, the other program partners now serve in only a limited advisory capacity.

ATEC Scholarship Information

Allen Samuels Chevrolet-Geo awards five scholarships each year to graduates of the ATEC high school program. Scholarship recipients are chosen on the basis of recommendations from instructors, transcripts, and interviews with Gene Smirl, Service Director of Allen Samuels. Applicants must be willing to complete the associate degree program in automotive technology at TSTC–Waco.

The four-and-one-half-year program is structured as follows:

- The associate degree in automotive technology program at TSTC takes two and one-half years to complete. While enrolled at TSTC, students work at Allen Samuels either during the day or at night, depending on their class schedules.
- After completing their degree programs, scholarship recipients must work for Allen Samuels for an additional two years. Allen Samuels has dealerships throughout Texas; students can transfer to locations other than Waco if they choose.

Scholarship recipients are required to take and pass the ASE test for certification as master technicians.

Allen Samuels pays for books and tuition and pays each student's wages while he or she is in school.

Allen Samuels sets up a savings plan for each student. Under the terms of the plan, $25 is withheld from each paycheck: $12.50 goes into a savings account and $12.50 is set aside for the purchase of tools. When students complete their four and one-half years, each has $3000 in savings and each receives a complete set of automotive tools.

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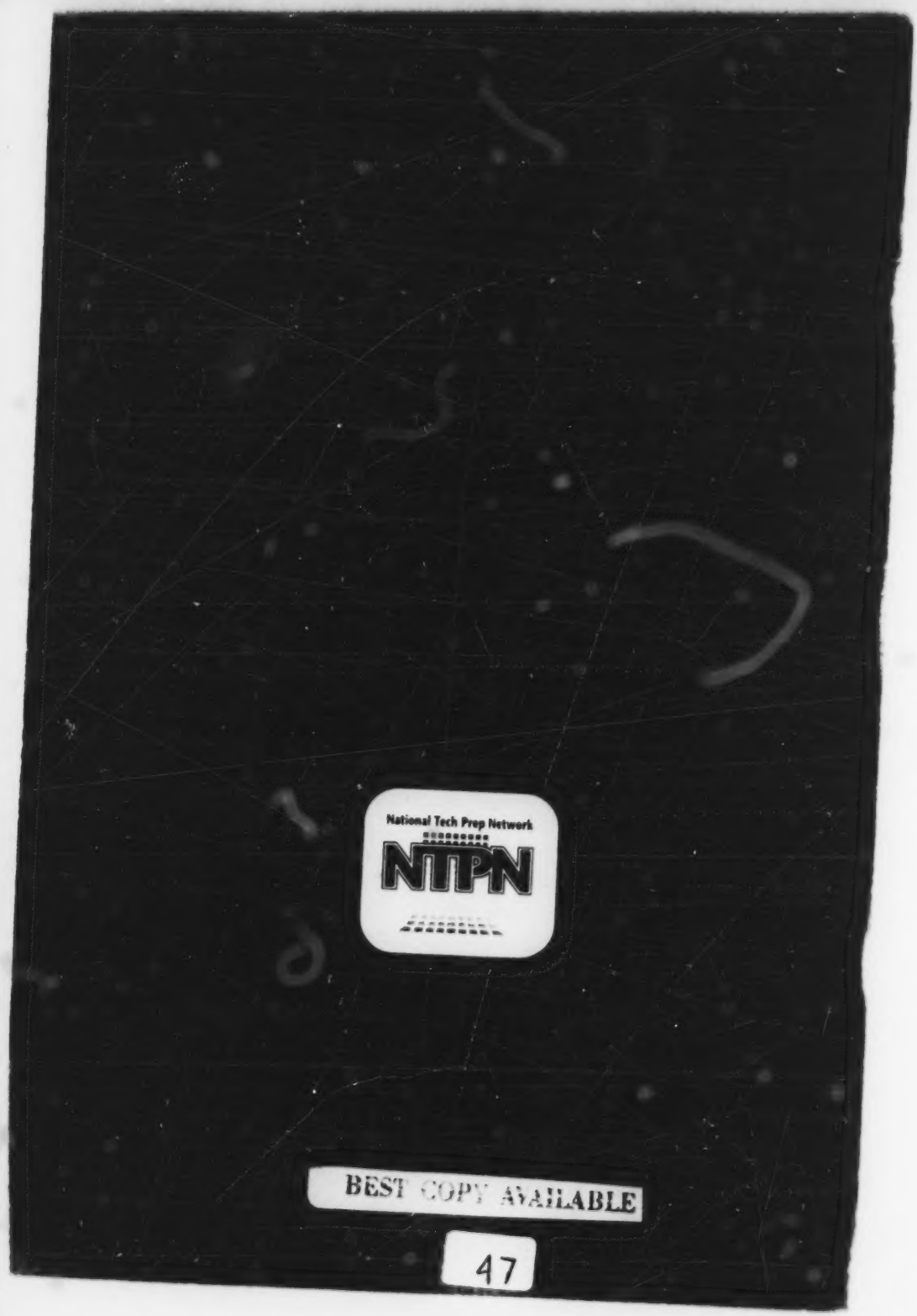

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